

# The Canadian Entomologist.

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VOL. XIX.

LONDON, JANUARY, 1887.

No. 1

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## AN EXPLANATION.

BY WM. SAUNDERS, LONDON, ONT.

A protracted absence from home has prevented me from offering earlier to the readers of THE CANADIAN ENTOMOLOGIST an explanation of the circumstances which have led to my resignation of the post I have held so long as Editor of this journal. For thirteen years it has been my pleasure and privilege to be thus brought in contact with most of the active workers in the Entomological field, with many of whom I have held pleasant intercourse both by correspondence and in person, and it occasioned me much regret when I found it necessary to sever my connection with those editorial duties which had hitherto given me so much pleasure. Shortly after the proposal was made that the Government should establish a number of experimental farms in Canada, I was employed to collect such information as might aid in determining the best course to pursue. This enquiry resulted in my becoming greatly interested in the work, and subsequently in my accepting the position of Director of the same. The duties of this office are so weighty and constant as to make it necessary for me to give up all other engagements and devote to it my entire time and thought. Since Economic Entomology is one of the subjects which will claim attention at the principal or central farm, I hope still to be able, if not directly, at least indirectly, to aid in advancing this important branch of Entomological study. I desire to tender my sincere thanks to the many kind friends who have aided me in the past by supplying useful matter for the journal, and would bespeak for my esteemed and able successor a continuance of that confidence and support. Our readers may rest assured that my withdrawal from the editorial chair will not in any way lessen the value and usefulness of THE CANADIAN ENTOMOLOGIST; indeed, I have reason to believe that, under the skilful management of the newly appointed Editor, the Rev. C. J. S. Bethune, the future of our valued monthly will in many respects be an improvement on the past.

## NOTE ON THE EUROPEAN GRAPTA C ALBUM.

BY W. H. EDWARDS, COALBURGH, W. VA.

In the Entom. Mo. Mag., xxiii., p. 186, Jan., 1887, is the statement by Mrs. Hutchinson, of Leominster, to this effect: that the writer caught a female *C Album* which was hovering about currant bushes, and obtained from her many eggs, laid between 27th April and 6th May. The eggs hatched between May 5th and 11th, and the larvæ were full grown from 17th to 23rd June. The first butterfly came from pupa 26th June, the last 3rd July. "*Two of the insects paired on June 30th, and the female commenced laying on 1st July*, and continued doing so until the 10th, when there were 120 ova in all." (Neither one of this pair then could have more than four days out). From these eggs butterflies were obtained, from 17th to 27th August. "Several pairs were put together, but no ova were obtained." I do not know whether this last means that actual copulation took place or not, but should suppose not, as eggs could not have been formed in the ovaries, these butterflies being of the last brood of the year, and the one which hibernates.

The interesting point in this narrative is that butterflies will pair in captivity. I myself have never known such an instance, but in CAN. ENT., xviii., p. 17, it is recorded that a pair of *Satyrus Alope* paired when put under a net, as observed by Miss E. L. Morton. Some butterflies come from pupa with eggs mature. I have seen pairs of *P. Ajax* copulating, when the wings of the female were not yet dry. In case of *Heliconia Charitonia*, the pairing often takes place before the female is clear of the pupa skin. *Argynnis Myrina* has been recorded as pairing almost immediately after both sexes left the pupæ. And the eggs of *P. Tharos* are fully formed on coming from chrysalis. On the other hand, many species require 10 or 15 days at the least to mature their eggs, as our larger Argynnis, several Papilios and others. It is well worth while to experiment with different species in this direction.

These observations of Mrs. Hutchinson settle the question as to *C Album* being single or double-brooded. Westwood, in Humphrey's Brit. But., 1846, says the species is double-brooded. But Newman, Brit. But., 1871, p. 50, says that an idea seems prevalent that there are two broods in the year, but that he thinks it is a mistake, and never had satisfactory evidence of it. So that up to 1871, it seems not to have been a settled

question. No book that I have gives any farther information. The "Larvæ of British Butterflies," by the late Wm. Buckler, recently published, says nothing on the point.

There are three American species of *Grapta*, at least, which correspond to, and represent, *C Album*, namely, *Comma*, *Satyrus* and *Faunus*, and so high authorities as Dr. Staudinger and Mr. Möschler once pronounced all these to be *C Album*. But after figures of the larva of *Comma* were published, 1871, But. N. A., vol. 1, and descriptions of the larva of *Satyrus* by Messrs. H. Edwards and Pearson, it was everywhere conceded that these two were not *C Album*. That was something gained. But many, especially European, authors still hold *Faunus* to be *C Album*. *Faunus* is remarkable for its lack of variability. Examples from all localities are identical in coloration and markings. Whereas *C Album*, if all the phases in color, markings and size, which in Europe pass as *C Album*, be really but one species, a matter which I very much doubt, varies wonderfully, and takes in not only phases like the three American species mentioned, but of three or four others, and some not represented in America. And now comes proof that *C Album* is two-brooded, while it is certain that in no part of its territory is *Faunus* more than single-brooded, although in a considerable part of such territory it flies in company with *Comma*, and apparently the season is as favorable in these districts for two broods in *Faunus* as in *Comma*. *Faunus* is a sub-boreal species, flying from one ocean to the other, but to the southward it also occupies Canada and parts of New England, New York, Pennsylvania, and Virginia, and even to Georgia, in the mountainous sections. And being boreal and one-brooded, it is fair to presume that it came from the north; that at the time, ages ago, when the two continents were united, the species occupied the northern parts of both. When the separation took place, the European branch split into numerous varieties, and became double-brooded, yet retained its identity as one species (that is, if the European lepidopterists of to-day are right in their views), and shows nowhere differences between any of its preparatory stages—one multiform species.

And the other branch, on the western continent, threw off diverse forms, several of which have come to have very different caterpillars from the original type. These also came to be two to four-brooded, and two, at least, became seasonally dimorphic in coloration. But one form, *Faunus*, remains single-brooded, and shows no tendency to vary, and may

be presumed to be nearer to the primeval type of the species than any of the forms that now compose the group. Of course, this one-brooded, non-varying form is to-day not the same thing as the two-brooded, very variable form found in Europe. They have come to be two distinct species. It is unfortunate that even now so little is known of the early stages of *Faunus*. It is a matter that the northern lepidopterists should have studied, and all stages from the egg might easily have been seen and described. There may be important differences between the larvæ and pupæ of *Faunus* and *C Album*.

#### ADDITIONS TO THE LIST OF CANADIAN LEPIDOPTERA.

BY J. ALSTON MOFFAT, HAMILTON, ONT.

I give the following names in the Geometridæ as new to the Canadian List:—

1. *Caberodes majoraria*, Guen.
2. *Endropia marginata*, Minot.
3. " *textrinararia*, Grote.
4. *Ephyra pendulinaria*, Guen.
5. *Arthena lucata*, Guen.
6. " *albogilvaria*, Morr.
7. *Deilinia variolaria*, Guen.
8. *Semiothisa minorata*, Pack.
9. *Phasiane mellistrigata*, Grote.
10. *Thamnonoma brunneata*, Thun.
11. *Cymatophora umbrosaria*, Hub.
12. *Heterophleps Harneiata*, Pack.
13. *Lobophora anguilineata*, Grote.
14. " *montanata*, Pack.
15. *Petrophora prunata*, Linn.
16. " *lunigerata*, Walk.

All the common species that were easily obtained in this locality, have had names in my collection for many years, but owing to the changes that were being made in the genera and synonymy of species, I was not in a

position to follow them up, so that when Mr. Grote's "New Check List" appeared, which I have followed in this, I found that several of my old names had disappeared altogether, and others had been rendered doubtful.

The Rev. Geo. D. Hulst, of Brooklyn, N. Y., opened communication with me last fall, with a view to exchange; he also at the same time kindly offered to name anything he could for me. Gladly availing myself of the services of so competent an authority, I sent to him all that I considered doubtful in my collection, as well as the new and unnamed material I had on hand. The result was the correction of several errors, as well as the addition of new species to my list. Nos. 1 and 2 are old specimens. No. 5, one specimen taken last summer. No. 6, quite common here. No. 8, one specimen, last summer's capture. No. 11—my *Cymatophoras* were badly mixed, and I have some single specimens that yet want determining. No. 12, quite a common insect here, but which I had the pleasure of adding to Mr. Hulst's collection, where it was wanting. No. 15, a single specimen; 16 a single specimen I have had for years, and have not met with another, and have only seen one in any other collection. Mr. Hulst gives it as *Cidaria lunigerata*, var. *dispunctaria* Pack. Of the other numbers, I have received the names from different sources in recent years.

Mr. Hulst also named some that are new to me, but already in the Canadian List. Last summer is generally acknowledged to have been poor in Lepidoptera, yet I was quite fortunate in obtaining new things in the Geometridæ, although so many of them were but single specimens of a kind.

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### A NEW HOMOHADENA.

BY G. H. FRENCH, CARBONDALE, ILL.

#### *Homohadena Elda*, n. sp.

Expanse 1.30 inches. Apex very slightly produced, the posterior angle rounded; eyes naked; palpi oblique, projecting beyond the head in their natural position about the width of the eyes; tibiæ unarmed; abdomen equalling the hind wings; covering of thorax mostly scales. Color, warm gray, slightly wine tinted; basal half line black, not very distinct, strongly angulated outward on the subcostal vein, a black basal dash crossing the lower end of this line, the space enclosed between the costa



and these two lines sordid white; t. a. line black, double, the inner portion sub-obsolete, general course nearly straight, but from the costa to median vein extending slightly inward, and from median to sub-median slightly arcuate outward, as also from sub-median to posterior margin; median shade prominent, smoky black, straight, extending from costa to posterior margin, in width .04 of an inch, a gray spot in the lower end of it, and bordered externally by the internal portion of the black annulus of the reniform, and below median venules by what seems to be a portion of the t. p. line; t. p. line obsolete save some black points between white on the veins and the arcuate black portion before spoken of, bending outward round the reniform and inward below this; sub-terminal line whitish, irregular, faintly sending gray streaks to the margin on the veins. Stigmata large; orbicular elongate transversely to the wing, black annulate with a white shading inside this; reniform kidney-shaped with the outer depression quite prominent, a prominent black border toward base of wing, but none or only slight on the outside, inside this a white bordering that extends round the spot. Outer margin a black line, fringe concolorous with the wing. Hind wings pale smoky gray, nearly uniform, slight indication of a line through the middle, fringe whitish. Thorax gray with the shoulder tufts and posterior scales black tipped. As this covering had been slightly disturbed, could not tell whether these posterior scales formed a low tuft or not, but should think they did. Under side gray, with but faint indication of marks.

Described from two females from Soda Springs, Sishyon Co., California, one in the cabinet of James Behrens, and the other in the cabinet of G. H. French, captured in September, 1885.

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#### NORTH AMERICAN TACHINIDÆ.

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##### GONIA.

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BY PROF. S. W. WILLISTON, NEW HAVEN, CT.

The genus *Gonia* is one easily recognized by reason of its peculiar structure of the head and antennæ; unfortunately the separation of species is a much less simple matter. As is so frequently the case, isolated speci-

mens frequently furnish grounds for much more decided opinions than a richer material will sustain. I describe in the present paper five species that present characters sufficiently decisive to render their recognition not doubtful; other species I forbear to name till my material is richer. It will be seen that I make little use of the structure of the arista, a character that has been relied upon much in the European species; but I am satisfied that it is a variable one in individuals of the same species, and is, moreover, distinctly sexual. There is a distinct variation in different species in the position of the anterior cross-vein, as regards the termination of the auxiliary; of how much value the character is I am not yet decided.

Generic characters.—Moderately large species, not very bristly. Head very large, inflated; front very broad, only a little narrower in the male, with numerous, not very strong bristles; face in profile nearly perpendicular, the epistoma but slightly projecting; the oral margin with a row of bristles, not ascending on the edges of the median facial depression. Cheeks broad; bare, or with short bristles. Antennæ elongate; third joint two or three times as long as the second in the female, from four to eight times in the male; arista stout, composed of three joints, the second and third elongate, and joining each other at an angle, as though broken. Eyes bare. Palpi cylindrical. Scutellum with six strong bristles on its border. Abdomen broad oval or ovate; first and second segments each with a pair of median posterior bristles and one extreme lateral posterior one; third segment with a row on the posterior border. No spinule at tip of auxiliary vein; fourth vein obtusely angulated, without stump of vein, terminating in the costa a considerable distance before the tip; posterior cross-vein much nearer the angle than to the anterior cross-vein.

Head yellow, except the occiput, palpi yellow; thorax black, margins of dorsum and scutellum often yellowish; legs black. Larvæ, so far as known, parasitic on hymenoptera and lepidoptera.

#### *Table of Species.*

- 1.—Abdomen wholly black, or at most only somewhat reddish on the sides of base; claws and pulvilli of male small. . *FRONTOSA* Say.  
Abdomen largely or wholly red or yellow..... 2
- 2.—Face and antennæ golden yellow; claws of male small. . *SENILIS*, n. sp.  
Face and antennæ not golden yellow..... 3
- 3.—Sides of face, pleuræ and femora with yellow hair; claws and pulvilli of male small..... *PORCA*, n. sp.

- Sides of face with black bristles; pleuræ not with yellow hair. . . . 4  
 4.—Abdomen reddish yellow, with or without small black spots; claws  
 and pulvilli of male small. . . . . SEQUAX, n. sp.  
 Abdomen largely black; claws and pulvilli of male large. . . . EXUL, n. sp.

GNONIA FRONTOSA Say, J. Acad. Phil. vi., 175; Compl. Wr. ii., 365.

*Gonia philadelphica* Macquart, Dipt. Exot. ii., 3, 51, 6.

? *Gonia albifrons* Walker, List, etc., iv., 798.

♀. Length 9.5-10 m.m. Face and front light yellow, with a silvery, or slightly golden sheen; front a little translucent on the sides when seen from above; face on the sides with short black bristles, and a number of longer ones near the sides of the median depression; median depression in its greatest width about as wide as the least width of the sides of the face; cheeks with short black bristly hairs only. Antennæ blackish brown, the second joint and base of third yellowish; second joint about one-third the length of the third; second joint of the arista not more than three-fifths the length of the third. Palpi yellow. Dorsum of thorax black; the humeri, post-alar callosities, and scutellum in large part, luteous yellowish; dorsum, when seen from behind, distinctly gray pollinose, leaving four slender stripes. Bristles of scutellum long, reaching to base of third abdominal segment. Abdomen deep shining black; the second segment with a very narrow, the third with a narrow, the fourth with a moderately broad, basal white-pollinose cross band. Wings nearly hyaline behind; the costal, subcostal and first basal cells very distinctly tinged with brown.

♂. Length 9-10 m.m. Front distinctly narrower, and more projecting below. Median facial depression deeper, larger, and longer, broader below than the sides of the face. Antennæ larger and longer, the second joint shorter, not more than one-fifth or one-sixth as long as the third; arista shorter than the joint, its second joint curved, three-fifths, or three-fourths as long as the third. Dorsum of the thorax a little more hairy. Abdomen more elongate or egg-shaped, the sides of the second and third segments sometimes reddish. Tarsal joints of front feet a little less disciform, the claws a little longer.

This description is drawn from twelve females, mostly collected together in Fairmount Park, Philadelphia, by Mr. E. Keen, and eight males from Minnesota, collected together. They are all closely related, and their absolute identity seems certain. Among these specimens, however,



there is no absolute uniformity in the length of the arisal joints, though not much discrepancy.

All the rest of my specimens, from various localities throughout the United States, are larger, reaching twelve and a half millimetres in length and none of them as small as the largest of the ones described. The pollinose bands of the abdomen are usually broader on the second and third segments, the wings in none so strongly infuscated proximally, and in most the infuscation is more or less obsolete; the antennæ vary from red to black, the second joint of the arista in the female varies from one-third to three-fourths as long as the third joint; in the male from one-half as long to longer. The dorsal thoracic stripes vary from very slender ones in Colorado specimens, to broader and more distinct ones in New England, North Carolina, and Southern Californian ones. Specimens from Carolina and New England have the basal part of the venter yellowish red, with moderately large spots on the sides of the basal segments above. A specimen from Wyoming has the thoracic dorsum strongly pollinose, and the bands of the abdomen unusually broad. Two others from California have the second joint of the arista very short, not a third of the length of the third, the wings scarcely at all infuscated in front, and, unlike all the other specimens, the cheeks do not have black hairs, but yellow pile; other specimens from California, however, are like the eastern ones in this respect. Yet another, rubbed (female) specimen, from Connecticut, differs in having the sides of the face distinctly narrower, considerably narrower than the median portion. The bristly hairs on the sides of the face vary not a little in size; those of the described specimens leave a more bare space below on the inner side, that is less, or not at all, apparent in the larger specimens.

The value of these various characters I confess myself unable to decide. Only this much seems certain, no, or little reliance can be placed upon the comparative lengths of the arisal joints; and the second joint is always longer and more bent in the male than in the female.

I think there can be little doubt but that this is Say's species; his "large, obsolete, reddish brown spot near the base" of the abdomen is not usually, though frequently, present. The synonymy of *G. philadelphia* seems equally certain. The species must be closely allied to, possibly identical with *G. fasciata* Meigen, of Europe, the larvæ of which have been found in nests of *Bombus terrestris* and *Megilla reclusa*, where the flies deposit their eggs. A specimen from the Boston Society of

Natural History, somewhat teneral with red antennæ, bears the label :  
"From *Pyrrharctia isabella*, Apr. 24."

Altogether, I have examined about seventy-five specimens, from New England, New York, Pennsylvania, North Carolina, Indiana, Minnesota, Montana, Colorado, Wyoming, Northern and Southern California.

*GONIA SENILIS*, n. sp.

♂. Length 10 m.m. Front and face golden yellow, not very changeable, the vertex on either side sub-translucent when seen from above; sides of the face considerably narrower than the median depression, clothed with short black bristles. Antennæ wholly pure orange-yellow, the tip of arista brownish, second joint very short, third very long, six or eight times longer than the second; second joint of the arista shorter than the third. Thorax not densely pollinose, when seen from behind, with four slender stripes, scutellum luteous at tip only. Abdomen black, the sides broadly red, forming a moderately broad lateral posterior margin to the first and reaching to about the middle of the third segment on the sides; pollinose bands broad. Wings nearly hyaline, anterior cross-vein nearly opposite the middle of the subcostal section of the costa. Claws and pulvilli small.

One specimen, Western Kansas. Although I have but the single specimen, I venture to describe this species. The color of the antennæ seems evidently normal; should it really be darker in other specimens, however, the other characters given will, I believe, render the species recognizable.

*GONIA PORCA*, n. sp.

♂. Length 13 m.m. Face and front light yellow with a silvery sheen, the front, except in a very oblique light, oily translucent on the sides; sides of the face without the usual short black bristles, except above; the largest part, as also the cheeks, is clothed with long fine hairs or pile; the usual row along the sides of the median depression. Median depression wider than the sides of the face below. Antennæ black, the third joint five or six times longer than the second; second joint of the arista shorter than the third. Dorsum of thorax thinly pollinose, stripes not very distinct; the sides more or less and the scutellum luteous yellow. Pleuræ with long fine yellow hairs or pile. Abdomen yellowish red, shining; pollinose bands narrow, that on the second very

narrow; first segment, under the scutellum, the second with a median stripe, the third with a stripe more or less dilated behind, and the fourth chiefly, black. The anterior femora behind with long fine light yellow hair. Wings nearly hyaline, the costal cells scarcely infuscated.

Two specimens, Mt. Hood, Or. The moderately abundant, long, light yellow fine hair on face, pleuræ and four anterior femora is characteristic.

*GONIA EXUL*, n. sp.

♀. Length 12, 13 m. m. Front and face light yellow, with a semi-translucent appearance as though oiled; when seen obliquely, with a silvery sheen; sides of the face with numerous, short, black bristles, on the inner part, near the sides of the median depression, with three or four moderately stout bristles; median depression small and narrow, not as wide as the sides; cheeks without black bristles. Antennæ blackish brown, second joint and base of third yellow; second joint about one-third the length of the third; arista variable, third joint not twice the length of the second. Dorsum of thorax gray pollinose, when seen from behind leaving four moderately broad stripes, the margins more or less and the scutellum yellow. Abdomen yellowish red; first segment under the scutellum, the second with a broad median stripe, the third except the anterior angles, or, rather, with a large triangle reaching the whole width of the segment behind and touching in front more or less broadly, the dorsum of the fourth wholly black; pollen of the whole abdomen variable in different reflections, but most conspicuous on the base of the third and the whole of the fourth segments. Wings nearly hyaline, the veins yellowish, except posteriorly.

Ten specimens, Connecticut, Massachusetts, New York.

a. Males from California, that I cannot distinguish, have the antennæ wholly black, the third joint five or six times the length of the second, the face strongly silvery pollinose, and the claws and pulvilli very large, considerably longer than the terminal joint of the tarsi. In some, the black triangle on the third abdominal segment is much smaller. A female with them seems to agree in all respects with the Eastern specimens.

b. A female specimen from California, with the abdomen marked similarly, has the third joint of the antennæ shorter, not more than twice the length of the second, the second joint of the arista very short, and the bristles on the sides of the median depression not parallel with the edge, but divergent, whisker-like.

c. Two female specimens from Arizona differ distinctly in having a broader and more projecting face, smaller eyes, whiter and more dense pollen on face, thorax and abdomen. Another specimen with these two, however, though agreeing in the latter respects, has the face of the usual width.

d. A male specimen from North Park is of a distinct species, though closest allied to the present. The sides of the face are unusually narrow, the front short, convex and almost horizontal, the abdomen marked more like that of *G. senilis*, the size smaller (11 m.m.), the claws and pulvilli large.

GONIA SEQUAX, n. sp.

♂. Length 12-13 m.m. Like the males of *exul*, except that the abdomen is either wholly yellowish red, with a black spot under the scutellum, and a brownish hind margin to the third segment, or with a slender black stripe on the second, and a small triangle on the third and fourth segments. The claws and pulvilli are very much smaller, much shorter than the terminal joints of the tarsi.

Three specimens, California.

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## NOTES ON THE GENUS EXOPROSOPA.

BY D. W. COQUILLETT, LOS ANGELES, CAL.

In my paper on "The North American Genera of Anthracina," which appeared in the last volume of the CAN. ENTOMOLOGIST (pp. 157-159), I proposed the name *Velocia* for those species of *Exoprosopa* which have four submarginal cells in each wing. Through the kindness of Dr. Williston, I have been put in possession of a paper by Prof. Camillo Rondani, entitled "Dipterorum Species et Genera Aliqua Exotica," published in 1863 in the Archivio per la Zoologia, vol. iii., and on pages 56 and 57 of this paper Prof. Rondani proposes the name *Hyperalonia* for the above group; this name being the earlier, must supersede the one proposed by me.

In the same paper Prof. Rondani proposes the name *Argyrosbila* for those species of *Exoprosopa* in which the third and fourth veins are joined together before the margin of the wing, instead of reaching the margin

separately; but I am firmly convinced that this character is too variable to be used for a generic separation. In a large series of *Exoprosopa doris* O. S. collected in Los Angeles County, Cal., every grade occurs, from the widely open first posterior cell to the contracted, closed in the immediate margin, or some distance before the margin of the wing. Those of the latter kind do not otherwise differ in any respect from the ones in which this cell is wide open, and as specimens of the latter kind were taken at the same time and place as the former, there seems to be no doubt of their specific identity.

I have discovered another form, closely related to *Exoprosopa*, but differing from it and from all other *Anthracina* known to me, in that the first posterior cell is divided by a cross-vein into two cells; following is a description of this new form:

*Exoptata*, n. gen.—Third antennal joint furnished with a distinct terminal style; second vein issues from the third opposite or nearly opposite the small cross-vein; anterior branch of the third vein connected by a cross-vein with the second, forming three submarginal cells; first posterior cell divided into two cells by a cross-vein placed some distance before tip of discal cell; anterior branch of third vein and veins 2, 3 and 4 terminate in margin of wing; no pulvilli.

*Exoptata divisa*, n. sp.—Front obscure chestnut-brown, pale yellowish tomentose and black pilose; face reddish-brown, pale yellowish tomentose; hyperstoma much produced; first two joints of antennæ reddish-black, black pilose, third joint black, elongate-conical at base; style about one-sixth as long as third antennal joint; proboscis projecting length of labella beyond the hyperstoma; occiput black, yellowish-white tomentose. Thorax black, yellowish tomentose, the sides and collar yellowish pilose; bristles above insertion of wings, black; pleura yellowish pilose. Scutellum reddish-brown, yellowish tomentose, the margin beset with black bristles. Abdomen obscure reddish-brown, irregularly spotted with black; first segment and base of the second pale yellow tomentose, apices of second and third segments black tomentose, base of the third white tomentose, fourth segment mixed black and yellow tomentose, fifth, sixth and seventh segments white and sparsely black tomentose; sides of first segment and base of second yellowish pilose, sides of rest of abdomen black pilose; venter obscure reddish-brown, third and fourth segments black tomentose except a white tomentose spot in centre of each; other segments white tomentose. Legs and tarsi wholly black, the tomentum,



pile and spines also black; front femora and tibiae destitute of stout bristles, claws of front tarsi scarcely visible. Wings blackish brown, the following parts hyaline; apices of marginal and first submarginal cells; second and third submarginal cell wholly; apical half of outer first posterior cell; second, third and fourth posterior cells except spot in base of each, that in second posterior cell extending into the third; apices of third basal and axillary cells; and middle third and apex of discal cell. Veins at bases of first submarginal, inner and outer first posterior, and of the third and fourth posterior cells, bordered with sub-hyaline. Halteres brown, the knob yellowish. Length 12-15 m. m. Two specimens. Cal.; Ariz. (Williston).

#### ALETIA ARGILLACEA.

BY A. R. GROTE, BREMEN, GERMANY.

I have found in various collections in Europe, both public and private, specimens of the moth of our Cotton Worm determined after Hübner as above. From a note from Dr. Staudinger, I gather that in his collection the moth is so determined and as proposed by me. Were I now to propose to call this species by its synonym, *Noctua xyliana* Say, I do not think any of the entomologists in Europe would agree thereto, or be governed by Dr. Hagen's reasons for the change. Say was no Lepidopterist, and his posthumous description of the moth is not recognizable, only that he tells us it is the moth so injurious to cotton. By this we translate his description. But Hübner's figure and text are quite sufficient to identify the species, and he gives us the proper classification of these moths. I myself have shown how *Aletia* and *Anomis* are to be separated. The latter, with its orange colored and angulated wings, is a sort of tropical *Xanthia*. The tropical genera of *Noctuidæ* are all less woolly than the temperate forms. In *Aletia*, the smooth, untufted body, the entire wings, the broad head, prepare us for the Catocaline moths, *Poaphila* and *Agnomonia*. It differs from *Anomis erosa* by the broader wings, with straight external margin, and, as I first pointed out to Prof. Riley, by the number of false feet in the larva. There is a second true species of *Aletia* in Texas, *hostia* of Harvey, but this second cotton-feeder is also Southern and may have been described from Mexico or Central America previously.

The generic group is tropical. *Aletia* extends into the temperate regions, attracted by its food plant and urged by an inner impulse to migrate northwardly during our summer, helped on its wanderings by the winds from the Gulf. But the winter overtakes and extirpates it over a wide territory, fortunately for the planter.

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### BOOK NOTICES.

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#### THE BUTTERFLIES OF INDIA.

We believe we are doing the readers of the CANADIAN ENTOMOLOGIST a service in calling attention to a work on the Butterflies of India,\* which has been in progress for five years, and of which two volumes are now finished. It was begun by Major Marshall and Mr. de Nicéville, of the Calcutta Museum, but at the conclusion of the first volume Major Marshall was obliged to withdraw from active participation in the work and leave its completion to his coadjutor, who has just given us the second volume.

The task will be appreciated when its extent is known. "India, the land of sunshine, is a land of Butterflies," says the opening passage of the preface, and yet the empire includes within its limits "every climate, from the eternal snows to the tropics." The number of known forms is vast. Following the order of Kirby's Catalogue, the work has reached the *Lycenidae*, and scarcely half is done; yet in these two volumes over six hundred species are already described from a region less than half as large as that embraced in Edwards' Catalogue of our species. The generic and family descriptions are almost wholly copied from Doubleday and Westwood's "Genera," but the species are freshly described, and there are added keys to the genera of each family and to the species of every genus or minor group of species. Geographical distribution, habits and variation

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\* The Butterflies of India, Burmah and Ceylon. A descriptive handbook of all the known species of *Rhopalocerus* *Lepidoptera* inhabiting that region, with notices of allied species occurring in the neighboring countries along the border; with numerous illustrations. By Major G. F. L. Marshall and Lionel de Nicéville, Calcutta. Vol. 1; 8 + 327 p., 18 pl., 1882-84. Vol. 2; 8 + 332 p., 8 pl., 1886. 8°.

are the principal topics treated in the non-descriptive matter, and this is reasonably full for such a work, and adds very decidedly to our knowledge. Undoubtedly when the insects come to be reared, many of the nominal species will be found to belong together, for De Nicéville has already discovered the probable existence of seasonal dimorphism in the Bombay Butterflies, "there being in several species an ocellated form which occurs only in the rains, the cold and dry seasoned being non-ocellated."

We regret, however, to say that the work adds practically nothing to our knowledge of the earlier stages. This will surely follow the publication of this first and only handbook to the Butterflies of England's great eastern empire, for, as the authors point out, such a work as the present is a *sine quâ non* to an attempt at that co-operation through which alone any great advance can be made toward a general knowledge, either of the elements of the fauna or of the life-histories of its prevailing types. When we remember, however, that our knowledge of the transformations of eastern Butterflies has hardly advanced in fifty years as much as it advanced at a bound a half century ago by the labors of Horsfield alone, we are glad to be assured that when this present preliminary task is done, Mr. de Nicéville will direct his energies and the grand opportunities his position at the Indian Museum afford him to this more telling work. We wish him then all speed in the completion of the present task.

One word about the illustrations, which are wonderfully good. They are drawn by two native artists, Grish Chunder Chuckerbutty and Behari Lall Dass—they must be natives—and mostly reproduced by "autotype" in London; they are therefore monochromatic, but the results are far superior to anything we have seen in which photography has borne a part. The half tones are wonderfully caught, and their closest examination reveals the unusually skillful and delicate touch of the artist. There are twenty-six plates in the two volumes, including one good chromo-lithograph, a plate of structural details, and one of caterpillars and chrysalids, besides a dozen or more wood cuts in the text.

The book will be completed in four or five octavo volumes of fine type, and it is expected within three years. Each of the volumes completed costs 14 rupees (about 25 shillings), and it is hoped that 60 rupees will cover the entire cost. Subscriptions can be sent to B. Quaritch, 15 Picadilly, London, Eng.

S. H. SCUDDER.

CATALOGUE OF CANADIAN PLANTS. PART III: APETALÆ, by John Macoun, M. A., F. L. S., F. R. S. C., Montreal. 1886.

The last publication issued by the Geological and Natural History Survey forms the third part of Prof. Macoun's Catalogue of Canadian Plants. Part I., POLYPETALÆ, and Part II., GAMOPETALÆ, have already been noticed in these pages. Part III., APETALÆ, carries the work on to the end of the Exogens and completes Volume I.

The value of this important work, which is quite indispensable to every student of Canadian Botany, is much enhanced by the Addendum and comprehensive Index of the whole volume, contained in the present Part. In the former we find corrections and additions to the information recorded under each species in Parts I. and II., so as to bring our knowledge of the whole of the plants mentioned down to date, and in the latter not only are the orders, genera and species given, but every synonym also appears.

In the publication of this work Prof. Macoun confers a lasting benefit upon the scientific world. No living Botanist has the knowledge of Canadian plants which he has acquired. Possessed of a keen faculty of observation which almost amounts to an instinct, he has had the advantage of travelling extensively and of collecting and studying in their native habitats most of the plants which have been found growing spontaneously in Canada. Moreover, by generously assisting all who apply to him for information, he has secured the hearty co-operation in his work of all the active Botanists in Canada, so that the "Catalogue of Canadian Plants" is not only a record of his own vast experience, which extends over a period of more than 30 years of constant study, but also includes the work of all other collectors and Botanists who have investigated or written upon the Flora of the Dominion.

So closely are the studies of Botany and Entomology associated together that some knowledge of Botany is actually a necessity to the Entomologist; particularly is this the case in the interesting work of investigating the life-histories of insects. It frequently happens that a very slight knowledge of the affinities of a given plant may save from starvation valuable larvæ which have been transmitted to a distance from the place where their proper food-plant occurs. Most larvæ will subsist upon plants of the same genus or others closely allied to them.

A good instance of this is presented in the numerous *Coliades*, all of

which will flourish upon the Common White Clover (*Trifolium repens*), although in a state of nature they may, according to the species, feed upon plants belonging to a dozen different genera, all of which, however, will be found to be of the same Natural Order as the clover (*Leguminosæ*). The *Argynnides*, again, will all feed upon our common blue Violet (*V. cucullata*), as will the *Pierides* upon common and easily procured cruciferous plants.

On the other hand, for a right understanding of the shapes and positions of flowers, and for a full appreciation of the beautiful methods by which fertilization of the ovules is secured, a knowledge of the structure and habits of insects is of inestimable value.

There is, too, an economic aspect of this case, for if insects will survive upon plants which are only and perhaps distantly allied to their natural food, it is obviously necessary that the cultivator should take this into consideration when engaged in the constant strife which he has to wage against injurious insects, and we even find that some species will actually flourish better upon such cultivated plants, when grown in large numbers; the Colorado Potato Beetle may be instanced in this connection, which thrives so luxuriantly upon the cultivated potato, but which, when confined to its natural food, the *Solanum rostratum*, eked out but a precarious existence. Otherwise it is useless to abstain from the cultivation of any crop which has been badly attacked, as a means of starving out its insect enemies, in a locality where there are numerous wild plants or weeds which are allied to the plant which it is desired to grow. This must be borne in mind with regard to the many pests affecting cereals which are able to find ample temporary lodgment in the various wild grasses.

J. FLETCHER.

#### NOTE.

LIVING PUPÆ.—The Rev. W. J. Holland (5th Avenue, Oakland, Pittsburgh, Pa.) has a large number of living pupæ of *Telea Polyphemus*, *Actias Luna*, *C. Promethea* and *Angularis*, *E. Imperialis* and *C. Regalis*, reared in the South, which he desires to dispose of at reasonable rates. His object is to assist and encourage a poor lad whom he has interested in Entomology. Application should be made to him at once.



## CORRESPONDENCE.

## BRITISH COLUMBIAN HYMENOPTERA.

*Dear Sir*,—I wish to acknowledge through the pages of THE CANADIAN ENTOMOLOGIST the following type specimens of British Columbian Hymenoptera, which will form a valuable addition to the Society's collection, from the Rev. George W. Taylor, of Victoria, B. C.:

<i>Ichneumon Vancouveriensis</i> , Prov.,	CAN. ENT., xvii., p.	114.
<i>Platysoma</i> (nov. gen.) <i>tibialis</i> , Prov.,	" "	115.
<i>Limneria compacta</i> , Prov.,	" "	116.
<i>Mesoleptus fasciatus</i> , Prov.,	" "	116.
<i>Phylax pacificus</i> , Prov.,	" "	117.
<i>Phylax niger</i> , Prov.,	" "	117.

The types of *Mesoleptus fasciatus* and *Phylax pacificus* were unluckily injured in transmission, but the others are in good order. This donation was announced at the last annual meeting, but was omitted from the report of the meeting published in THE CAN. ENTOMOLOGIST. I take this opportunity of drawing the attention of our members to the importance of following Mr. Taylor's example in presenting to the Society types of new species, or unique specimens, so that they may be placed in a position of safety, and at the same time may be accessible for examination by all. We have at present the finest collection of Canadian insects extant, and it is to the advantage of all of us to add to it and make it as perfect as possible. We have a commodious museum and good cabinets, so that all donations will be properly cared for and will be highly prized.

JAMES FLETCHER, President Ent. Soc. Ont.

## NORTH AMERICAN BUTTERFLIES.

*Dear Sir*,—In Mr. W. H. Edwards' last catalogue of the Diurnal Lepidoptera of America north of Mexico, is given, on pages 80-81, a list of species formerly credited to the North American fauna, but which he

omits for want of authentication. Among the species so enumerated I find the following :

*Callidryas cipris*, Fab.

*Gonepteryx marula*, Fab.

*Terias elathea*, Cram.

*Megistanis acheronta*, Fab.

*Aganisthos orion*, Fab.

Now I have specimens of all of these species which I purchased a few years ago from Mr. Herman Strecker, the locality in which they were taken being given by him as Texas. Now as it is of course inconceivable that an Entomologist of Mr. Strecker's standing would attach a false locality to a specimen in order to sell it, I trust that Mr. Edwards will include these species in his next catalogue.

H. H. LYMAN, Montreal.

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LEPIDOPTEROUS LARVA.

Dear Sir,—In response to the very interesting communication on page 124 of volume xviii. of THE CANADIAN ENTOMOLOGIST, I would suggest to the two lady Entomologists that the larva is very probably that of the Birch Dagger (*Apatela vulpinam*.) It is certainly, I think, that of one of the Dagger Moths, and, if there is a variation in the color of the tufts from published descriptions by Mr. Thaxter, perhaps it is not enough to suspect a different species. I need not add that it gives me great pleasure to see the interest which our ladies take in the study of Entomology, nor how very much we owe to them already, as Mr. Edwards has recently shown in the story of the discovery of the Aphid-feeding larva of that interesting butterfly, *Feniseca Tarquinius*. In my earliest papers I referred to the important discoveries of women in a science which needs delicate powers of observation and handling. From Madam Merian to our own day, the list widens gloriously, and I often wish that the names and addresses of all the lady workers in America could be got together. When I come home again I mean to try and secure them for publication, and I hope (as every one must away from home) that the day will be soon.

A. R. GROTE, Bremen, Germany.

